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P21932.A08

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants	:	Matthias FRYDA et al.	Group Art Unit: 2882
Appln. No.	:	10/030,133	Examiner: I. Kiknadze
Filed	:	January 25, 2002	
For	:	X-RAY ANODE AND PROCESS FOR ITS MANUFACTURE	

COMPLETION OF RECORD

Commissioner For Patents
PO Box 1450,
Alexandria, Virginia 23313-1450
Sir:

Applicant is herein submitting a copy of a form PCT/IB/338 (in English) and a form PCT/IPEA/409 (in English) to complete the record in the instant Application. Applicant notes that a form PCT/IPEA/409 (in German) was filed with the instant application on January 25, 2002. The Commissioner is hereby authorized to charge any fees necessary for consideration of this amendment to deposit account No. 19-0089.

Should there be any questions, the Examiner is invited to contact the undersigned at the below listed number.

Respectfully submitted,
Matthias FRYDA et al.

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February 20, 2004
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PATENT COOPERATION TREATY

99135227-1ST

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF TRANSMITTAL OF COPIES OF TRANSLATION OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 72.2)

To:

FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.
Leonrodstrasse 54
D-80636 München
ALLEMAGNE

Date of mailing (day/month/year) 05 February 2002 (05.02.02)	
Applicant's or agent's file reference 97-35227	IMPORTANT NOTIFICATION
International application No. PCT/EP00/07076	International filing date (day/month/year) 24 July 2000 (24.07.00)
Applicant FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V. et al	

1. Transmittal of the translation to the applicant.

The International Bureau transmits herewith a copy of the English translation made by the International Bureau of the international preliminary examination report established by the International Preliminary Examining Authority.

2. Transmittal of the copy of the translation to the elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following elected Offices requiring such translation:

JP,KR,US

The following elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

EP

3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report.

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

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Authorized officer

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Translation

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 97-35227	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP00/07076	International filing date (*day/month/year*) 24 July 2000 (24.07.00)	Priority date (*day/month/year*) 26 July 1999 (26.07.99)
International Patent Classification (IPC) or national classification and IPC H01J 35/18		
Applicant FRAUNHOFER-GESELLSCHAFT ZUR FOERDERUNG DER ANGEWANDTEN FORSCHUNG E.V.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
23 February 2001 (23.02.01)	26 November 2001 (26.11.2001)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP00/07076

I. Basis of the report

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

☐ the international application as originally filed.

☒ the description, pages 1-7, as originally filed;
pages _____, filed with the demand,
pages _____, filed with the letter of _____,
pages _____, filed with the letter of _____.

☒ the claims, Nos. _____, as originally filed,
Nos. _____, as amended under Article 19,
Nos. _____, filed with the demand,
Nos. 2-16, filed with the letter of 05 September 2001 (05.09.2001),
Nos. 1, filed with the letter of 13 November 2001 (13.11.2001).

☒ the drawings, sheets/fig 1/1, as originally filed,
sheets/fig _____, filed with the demand,
sheets/fig _____, filed with the letter of _____,
sheets/fig _____, filed with the letter of _____.

2. The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-16	YES
	Claims		NO
Inventive step (IS)	Claims	14	YES
	Claims	1-34	NO
Industrial applicability (IA)	Claims	1-16	YES
	Claims		NO

2. Citations and explanations

Reference is made to the following documents:

D1: US-A-4 159 437
D2: US-A-5 173 612
D3: EP-A-0 432 568
D4: US-A-4 622 688

1. Document D1 describes (see in particular column 4, lines 6-21, and Figures 1-4) an X-ray anode in which the anode material is on an anode window.

The problem addressed by the present invention can be seen as that of providing an X-ray anode in which the window material has the required mechanical strength, will withstand high levels of energy in the electron beam, and is not toxic (see page 2, line 12 - page 3, line 4 of the description).

X-ray windows made of diamond are already known (see, for example, document D2). Since it is stated in D1 that an X-ray permeable material can be used for X-ray anode windows, a person skilled in the art would consider the possibility of using diamond, and would find an X-ray anode in conjunction with a

diamond window to be well suited to the application in question. There do not appear to be any technical prejudices against the use of diamond because it is already known that that diamond windows are easily manufactured (see D2, column 2, lines 8-12), and it is also known that diamond not only has good X-ray permeability but also has an excellent ability to dissipate energy in the electron beam away from an X-ray anode (see D3, column 4, lines 10-27).

D3 shows that for an electron energy level of 100 keV the maximum diamond window thickness is 45 µm. For a person skilled in the art, it is clear that the maximum window thickness depends on the electron energy level, and that with higher energy levels the window can be thicker. He would therefore choose the thickness of the diamond window according to the mechanical strength and heat dissipation requirements. Since Claim 1 does not specify the electron energy level, he would as a matter of principle also consider thicker windows.

In view of the above considerations, a person skilled in the art would regard the combination of all the features of Claim 1 as a matter of routine procedure. The subject matter of Claim 1 therefore does not involve an inventive step and hence fails to meet the requirement of PCT Article 33(3).

2. It is known from D3 (column 4, lines 14-15) that the diamond window to which the anode layer is applied can be monocrystalline or polycrystalline. The X-ray anodes described in D1 and D3 are metallic. D4 (see in particular Figure 3 and column 3, lines 26-50) describes an X-ray anode used in conjunction with a window, the anode being composed of a metal or an

alloy and comprising a plurality of metallic layers.

A person skilled in the art would be able to determine the appropriate thickness for the anode layer according to the electron energy level and type of anode material. If necessary, he could also provide an intermediate layer to improve adhesion or act as a radiation filter, and he could also equip the X-ray anode with a temperature sensor.

The X-ray anodes according to Claims 2-13 therefore do not involve an inventive step (PCT Article 33(3)).

3. The X-ray anodes described in D1 and D3 are intended for X-ray equipment. To a person skilled in the art, it is clear that X-ray equipment includes X-ray microscopes.

The uses for the X-ray anodes according to Claims 15 and 16 therefore do not involve an inventive step (PCT Article 33(3)).

4. None of the documents cited in the search report describes an arrangement involving a diamond window and an anode in which the diamond window is also a temperature sensor, nor is an X-ray anode with a diamond window of this type suggested by any of the said documents.